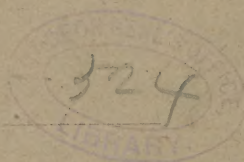


GERHARD (Wm Paul) *With the compliments of
the author.* *W*

THE RAIN BATH
AT THE
UTICA STATE
HOSPITAL.

BY
WM. PAUL GERHARD, C. E.
CONSULTING ENGINEER FOR SANITARY WORKS.

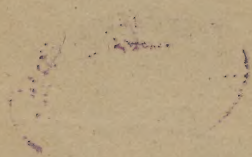


presented by the author

NEW YORK, N. Y.

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PRIVATELY PRINTED FOR THE AUTHOR.

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THE NEW RAIN BATH OF THE UTICA STATE HOSPITAL.

A BATHHOUSE fitted up entirely with "rain baths" has just been completed at the Utica State Hospital for Insane, from plans and specifications and under superintendence of the writer. The following description and the accompanying illustrations showing plans, details and views of the construction of the bathhouse are published in answer to many inquiries received by the writer concerning "rain baths" for institutions. For a general description of the rain bath and the advantages claimed for the same the reader is referred to the writer's pamphlet, "The Modern Rain Bath."

It is but a few years since the idea, which originated in Germany, of substituting douche or spray baths for the usual ordinary bathtubs in people's baths and in bath-rooms for public institutions, was carried out for the first time in the United States. At the suggestion of Dr. S. Baruch, a hydropathic physician, of New York City, who published in 1891 a pamphlet entitled "A Plea for Public baths," the New York Juvenile Asylum erected a rain bath for bathing the children. Then followed several public and semi-public bathhouses—viz.: The People's Baths in Centre Market Place, the public baths erected by the Baron de Hirsch Fund trustees, the baths at the Demilt Dispensary, and those connected with the Gymnasium of the Hebrew Institute, all in the city of New York. The Young Men's Christian Association building at Cedar Rapids, Iowa, and a high school at Scranton, Pa., were also fitted up with such rain baths.

Some of the above baths, planned and designed by the writer, have been described and illustrated in THE ENGINEERING RECORD heretofore,* and were subsequently reprinted in a small pamphlet which has had a very wide distribution among architects and superintendents of public institutions. At the special request of the President of the New York State Commission in Lunacy this pamphlet was sent by the writer to the medical superintendents of all the State hospitals in the State of New York. In a circular of inquiry, sent out somewhat later by the New York State Commission in Lunacy, to all State hospitals for insane, the question was propounded: "Have you a spray bath in operation, and do you regard that method of bathing patients with favor?"

It is interesting to read the replies received, which were on the whole highly favorable to the new method of bathing.

The Superintendent of the Utica State Hospital replied: "I am disposed to regard with favor the method of bathing patients by means of a spray. It is in successful operation in three wards at present, and will be extended with the extension of facilities therefor."

The Superintendent of the Buffalo State Hospital replied: "We have no spray bath in use, but are putting one in. I think it can be used with success with a certain class of patients."

The Superintendent of the Willard State Hospital replied: "We have a spray bath in operation and regard it with much favor."

The Superintendent of the St. Lawrence State Hospital replied: "We have no spray bath in operation in the wards. I should not consider the use of a spray desirable except in a general bathing-house under the direction of an independent and responsible man."

The Superintendent of the Rochester State Hospital stated: "The spray bath is in use in the male department. It is my opinion that it is the best method for bathing a large proportion of patients."

The Superintendent of the Matteawan State Asylum for Insane Criminals stated: "In the case of filthy patients who require frequent bathing, and where numbers of them are associated together, I should regard this method of bathing with great favor. I should consider, also, that it might be used in bathing troublesome patients who might be injured in struggles to place them in a bathtub."

The Superintendent of the Willard State Hospital later on wrote: "Two spray baths have been in use for several

* The Baron de Hirsch Rain Baths were described and illustrated in THE ENGINEERING RECORD of February 13 and 27, those in the Demilt Dispensary in THE ENGINEERING RECORD of March 5, 1892, and those in the Hebrew Institute in THE ENGINEERING RECORD of March 12, 1892.

months past, one at the infirmary for men and one at the infirmary for women. In both buildings their use has been attended by the most gratifying success. In my opinion the 'spray bath' has four distinct and important advantages over the ordinary tub—viz.:

"1. It is absolutely safe. There is no possibility of scalding a patient, and the more remote danger of suicide in a bathtub is also overcome.

"2. Cleanliness is assured and the temptation offered to lazy attendants to bathe more than one patient in the same water is removed.

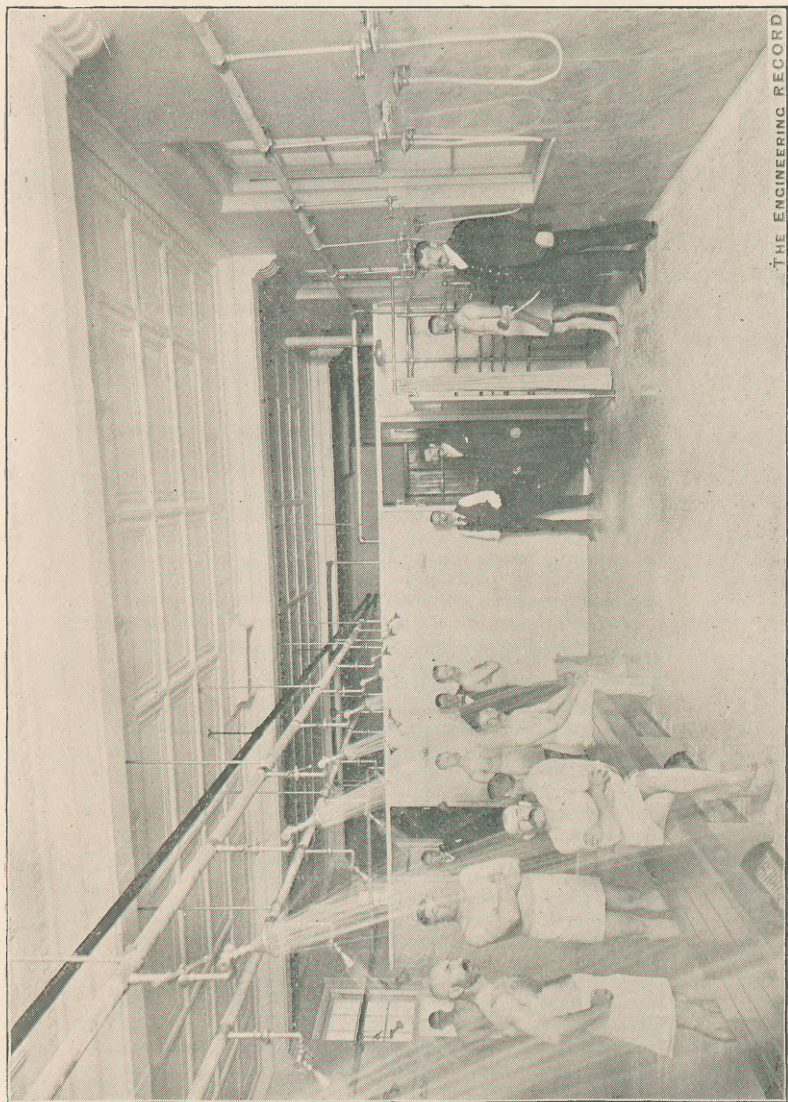
"3. A great amount of time is saved, which under the old method is used in filling and emptying the tub. Our experience has been that one spray will do the work of two tubs in a little more than half the time.

"4. There is much less hot water used, and there is a consequent reduction in the amount of coal consumed. While we have made no accurate experiments in this respect, my opinion is that the saving is considerable."

The Superintendent of the Middletown State Hospital writes later on more fully as follows:

"I send herewith a statement concerning a new method of bathing which has been inaugurated at this hospital, and which is known as the 'spray bath.' We refitted one of the bathrooms in the hospital annex as follows: A marble slab, about 5 feet long and $2\frac{1}{2}$ feet wide, was laid near the center of the room. This slab was dished and countersunk, with a waste pipe in the center to carry off the waste water. The entire floor around the slab was laid with slate upon a cement bed. This slate was graded toward the center of the room in order that all waste would speedily pass away. The sides of the room were lined with marble slabs, 6 feet in height, carefully cemented together. This made a water-tight compartment, with a dished floor, thus securing perfect drainage. A pipe from the cold-water supply in the basement was brought to a mixer, and a hot-water pipe was brought from the hot-water tank. The mixer is supplied with valves to regulate the influx of either hot or cold water, and is also supplied with a thermometer to register the temperature after the water is mixed. From this mixer is carried a rubber hose about 6 feet long. At the end of the hose is a nickel-plated spray which throws out a series of fine streams of water.

"The method of bathing patients is as follows: Some five or six patients are placed in a row upon the marble slab, which has been warmed by spraying it with hot water. Each patient is supplied with a cake of soap, and the attendant turns on the stream, having carefully observed that the temperature of the water is right. The temperature in the mixture will remain at about 100 degrees. It is probably $98\frac{1}{2}^{\circ}$ Fahr., or blood heat, when it reaches the surface of the person that is being bathed. One careful attendant can spray six patients at one time, and about five minutes are spent in spraying. After being thoroughly soaped, rubbed down and sprayed, each patient is furnished with a clean towel to dry himself. As soon as one set passes out of the bathroom another set passes in. Thus, about 60 patients can be bathed in an



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RAIN BATH AT THE UTICA STATE HOSPITAL IN OPERATION.

hour, with pure and correctly tempered water in sufficient abundance.

"The advantages of this method are:

"1. The dangers of scalding in a tub are avoided. Even if the water in the mixer should be quite hot it inevitably cools to a certain extent before it can reach the body of the patient.

"2. It furnishes clean water to each patient, and there is no opportunity for a lazy attendant to bathe three or four patients in the same tub of water.

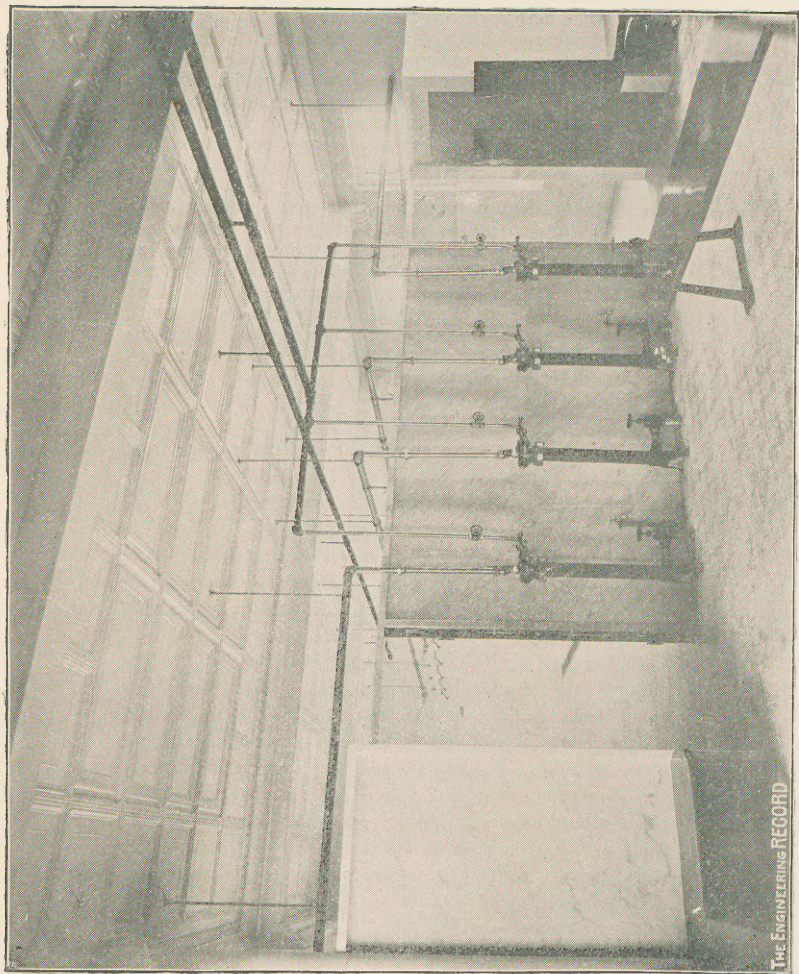
"3. The bath seems to be invigorating and exhilarating, and is greatly enjoyed by all the patients.

"This form of bathing furnishes not alone an opportunity for cleanliness, but as the water is applied with fine force over the entire surface of the human body, it stimulates to healthful action all the nerve extremities. It thus seems to invigorate the entire system. Thus far this method of bathing, which is new to this institution, is most satisfactory both to patients and attendants. By the old method of bathing only five or six patients could be bathed in one tub per hour. It was a slow and tedious process of drawing the water, of tempering it, of allowing the patient to bathe, and then drawing the soiled water from each tub and filling it again with fresh water. By the old method the attendant was obliged to endure a series of long and monotonous waitings, and thus he might in time quite naturally become careless and inattentive to duty. But the new method compels the close attention of the attendant while he works, but his task is soon and satisfactorily completed."

It will be seen from the above extracts, quoted from the Third Annual Report of the New York State Commission in Lunacy, that the opinions of medical men are highly favorable to this new method of bathing. It should be noted that most of the experiments were made with hand sprays, but to all practical purposes the inclined douche of the German rain bath is identical in action with the hand spray.

In August, 1893, the writer was requested by Dr. G. Alder Blumer, the Medical Superintendent, to visit the Utica State Hospital, and was directed by him to prepare a report with estimate of cost and preliminary plans for fitting up a bathhouse for patients in a building which was formerly the bakery of the hospital. The general scheme and the plans submitted were approved with a few slight modifications. Estimates were obtained and the contracts for the work let in the month of September, 1893. Owing to delay in completing the new bakery building, work on the fitting up of the bathhouse could not be commenced until May, 1894, and on August 31 of the same year the bathhouse was completed and a test of the same was made, which proved the work and the apparatus used to be in every way a success.

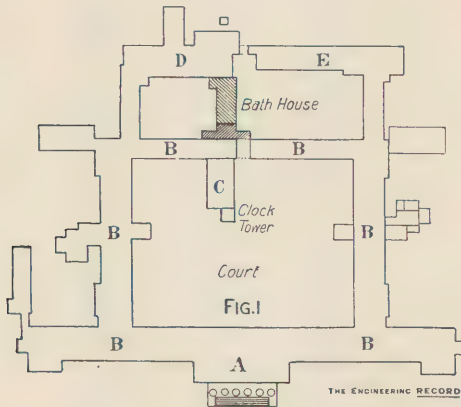
Preliminary to a detailed description of the bathhouse and its equipment the two photogravures here printed are given. These are made from photographs showing the apparatus in operation, the patients being bathed, and a



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DRESSING-ROOM SHOWING WARM-WATER APPARATUS.

familiarity with these views will add to the interest of the succeeding description. The instantaneous view in the bathroom shows all the overhead douches running. It shows the gutter in the center of the tiled floor, covered by a grating of brass, made in sections. The wooden bench in the center of the bathroom enables the bather to sit down while washing his feet. In the right-hand corner of the picture is shown a needle bath, placed in a marble stall. On the wall to the right are shown the hand sprays with rubber tubing, hung on the wall in nickel-plated brass forks. The marble partition at the end of the room separates the bathroom from the dressing-room. Through the door at the right a partial view of the dressing-room, with the clothes lockers in the distance, is obtained. This view gives a very good idea of the arrange-



A. Administration building. D. Boiler-house and laundry.
 B B B. Wards. E. Shops.
 C. Amusement hall.

ment of the overhead piping, and of the position in which the inclined douches are placed. The top pipe near the ceiling is the steam-heating main.

The other photograph is a view in the dressing-room, taken from the corner where the dumb waiter is placed, looking towards the marble dividing partition between the bath and dressing rooms, and showing the position of the four warm-water apparatus. Through the open doors are seen some of the inclined douches in the bathroom. The partition to the left in the picture is the end of the urinal stall, and the water-closet apartment with its marble divisions is shown at the opposite right-hand end of the room. This view gives a particularly good idea of the way in which the warm-water apparatus is fitted up. Four cold-water pipes pass up through the tiled floor to the

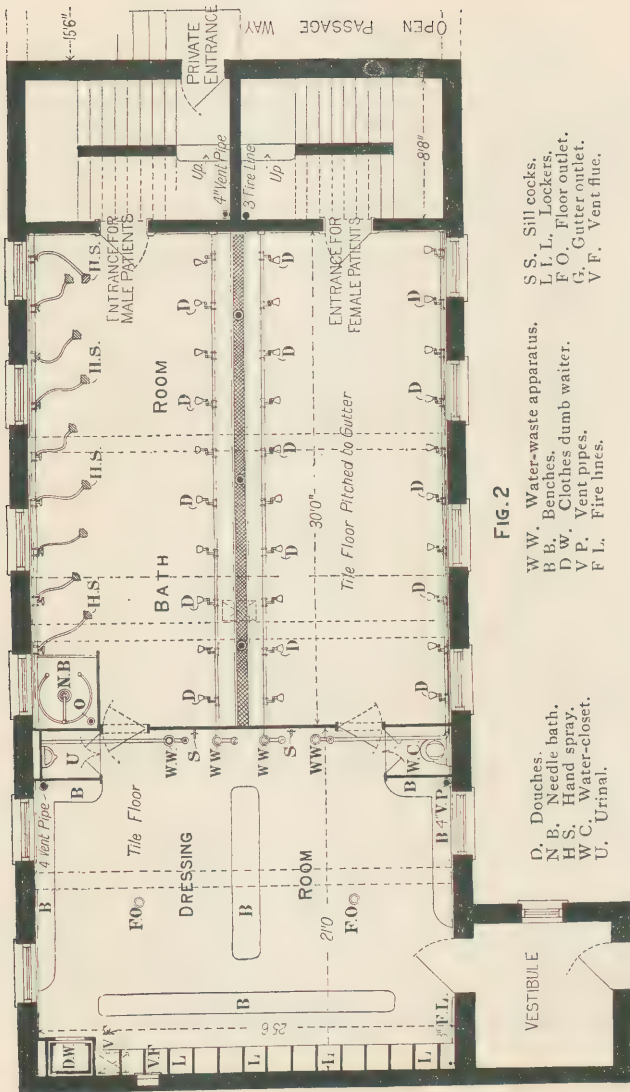
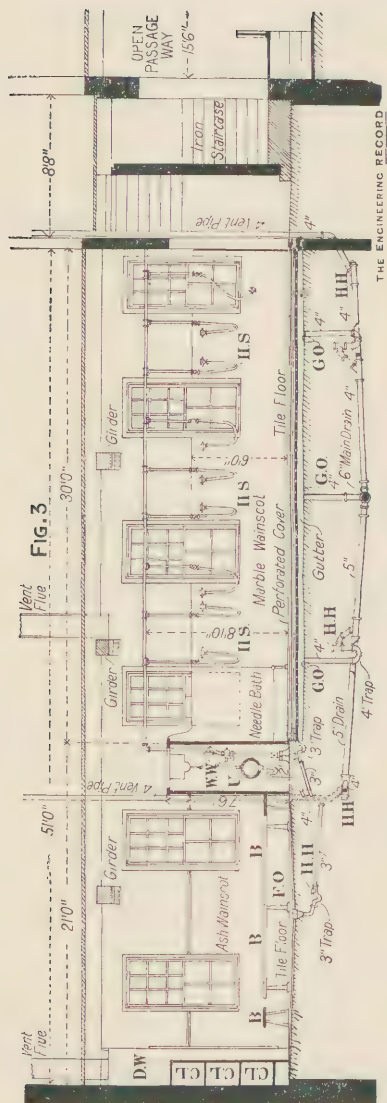


FIG. 2

- D. Douches.
 N B. Needle bath.
 H S. Hand spray.
 W C. Water-closet.
 U. Urinal.
 W W. Water-waste apparatus.
 B B. Benches.
 D W. Clothes dumb water.
 V P. Vent pipes.
 F L. Fire lines.
 S S. Sill cocks.
 L L. Lockers.
 F O. Floor outlet.
 G. Gutter outlet.
 V F. Vent flue.



THE NEW RAIN BATHS OF THE UTICA STATE HOSPITAL.

right of each apparatus, and are controlled by angle valves before entering at the bottom of the warm-water generators. The straight upward continuation of the apparatus represents the warm-water pipe, the two end ones turning to the right and left, while the two middle ones go out straight to the bathroom. The lower of the two ceiling pipes is a high-pressure steam main, which has four overhead branches, dropping to each of the four apparatus. The valve controlling the steam is placed at the right of each apparatus. The two sill cocks are for attaching hose for floor-washing purposes.

As the block plan of the hospital (Fig. 1) shows, the bathhouse is centrally located in the rear of the large open court or quadrangle, and between the amusement hall and the boiler-house and laundry. The bathhouse can thus be reached from any of the male and female wards without the necessity of making the patients go out-of-doors, a consideration of importance for the bathing in winter-time.

The general plan and arrangement of the bathhouse is shown in Fig. 2, which shows a plan of the ground floor. The vestibules and stairways occupy $8\frac{1}{2}$ feet in width, the bathroom is 30 feet long and $25\frac{1}{2}$ feet wide, and the dimensions of the dressing-room are $25\frac{1}{2}$ feet width by 21 feet length. There are separate entrances, stairs, and vestibules for men and women patients. The staircases are built of iron, and are 4 feet wide. Besides the two entrances from the wards there is a private entrance at each end of the bathhouse as shown.

The building is a two-story structure, and the second floor contains a large clothes-assorting room, communicating with the adjoining laundry, and also, by means of the dumb waiter shown in the corner, with the dressing-room of the bathhouse below. The other room has been fitted up as a photographer's gallery.

The bathroom proper, as shown in plan in Fig. 2, in longitudinal section in Fig. 3, and in cross-section in Fig. 4, contains four rows of sprays and douches. There is in the center of the bathroom a gutter for the removal of the bath waste water, the floor on either side of the gutter being properly pitched to allow the bath water to run off quickly. Four lines of warm-water supply pipes are carried, two of them suspended from the ceiling and the two others attached to the side walls, at a height of about 8 feet above the floor. Three of the lines supply 10 inclined douches each, while the fourth line supplies a needle bath and nine hand sprays. The room contains eight large windows.

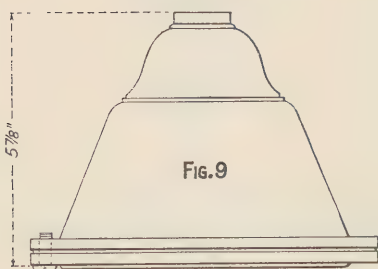
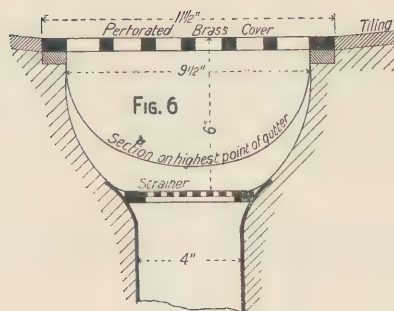
The dressing-room contains on the side nearest to the bathroom the four sets of warm-water apparatus (see section Fig. 5), a water-closet, and a urinal. On the extreme

wall of the bathhouse are placed 42 open clothes boxes arranged in three tiers of 14 boxes each. The dimensions of each box are 18x24 inches and 18 inches deep. In one corner of the room is placed a large clothes dumb waiter, in the opposite corner a fire stand-pipe. Benches of hard wood are placed around the free sides of the room, and there are also two long benches in the center as shown on the plan. The dressing-room contains three windows.

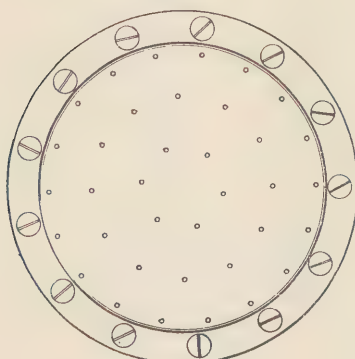
The space under the bath and dressing rooms has been excavated to a depth of 5 feet. The main floor is constructed of 8-inch brick arches of about 5 feet span, and 7-inch iron I beams, supported on brick piers 20 inches square. A concrete foundation was placed on top of the brick arches, and the top of same was graded to the central gutter as shown in section Fig. 4. The pitch of the floor is 1 in 30, or 5 inches from the wall to the gutter. The floor of the dressing-room is slightly pitched to the two floor outlets shown. The floor of the dressing-room and of the bathroom is finished with American unglazed or encaustic, embossed "Alhambra" pearl-gray and white tiles of a pleasing pattern and 6 inches square. A suitable tile border is carried all around the rooms.

The walls of the bathroom are wainscoted with white Italian marble, in large slabs, to a height of 6 feet from the floor. At the windows the marble is cut out at the height of the window sill and the sill is covered with marble, except at the needle bath, where the wainscoting is carried the full height across the window. All sharp corners in the marble-work have been rounded off to prevent patients bruising themselves. The partition dividing the bathroom from the dressing-room is of 1½-inch marble and 7½ feet in height. The water-closet and the urinal are also inclosed by partitions 7½ feet in height. In the vestibule the floor is tiled and an 8-inch marble base is carried around the walls. The walls of the dressing-room are wainscoted in ash to a height of 6 feet. All woodwork in this room, including the benches, lockers, and the flap doors, is of ash. The ceiling of both bath and dressing rooms is finished with stamped and paneled steel sheets, of an ornamental pattern, and is painted with ivory color special bath enamel paint.

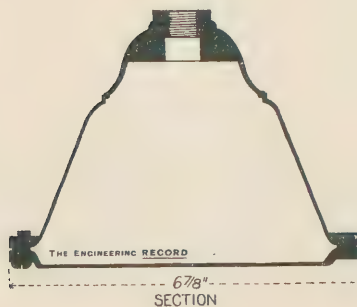
The floor gutter in the bathroom is about 9½ inches wide at the top, 6 inches wide at the bottom, and about 6 inches deep. It is molded in concrete, and has three outlets, to which the gutter is pitched as shown in longitudinal section, Fig. 3. A detail section of the gutter is shown in Fig. 6. Each outlet is covered in the bottom of the gutter with a 5-inch nickel-plated brass bar strainer, and is connected with a 4-inch waste pipe, trapped by a trap made of fittings, with extra deep seal. The gutter proper is covered with sectional perforated gratings of



ELEVATION



FACE OF DOUCHE



SECTION

cast brass, laid flush with the tiled floors, and having diamond-shaped openings.

The two floor outlets in the dressing-room consist of Barrett's brass cesspools, with shut-off gate valves, as shown in detail in Fig. 7. Each cesspool is trapped by a 3-inch running trap.

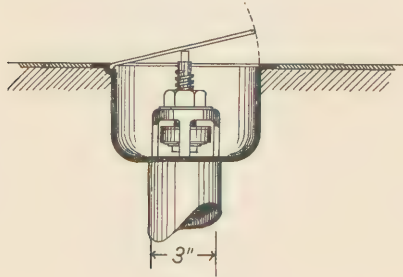
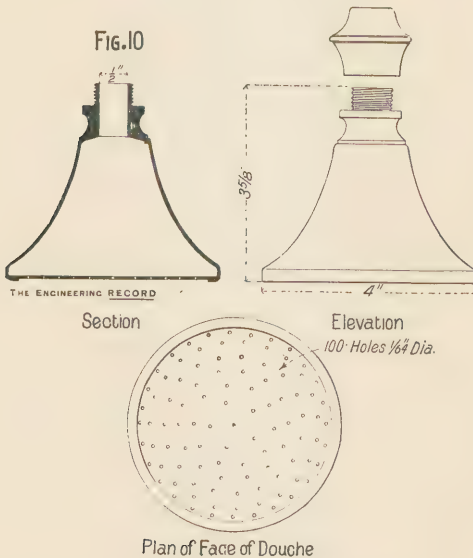


Fig. 7.

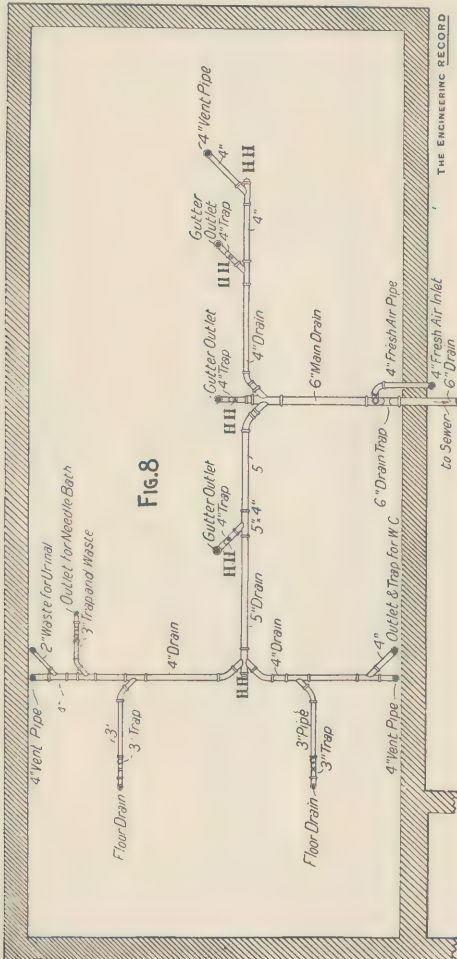
The drainage of the bathhouse is arranged as shown by Fig. 8. From the outside main sewer in the court a 6-inch branch sewer was run into the bathhouse. This



drain is of extra heavy cast-iron pipe, and has a 6-inch main trap, accessible in the space under the bathroom, and a 4-inch fresh-air pipe runs from the house side of the trap and terminates outdoors. From the 6-inch main are run the several submains and branches to the floor outlets and plumbing fixtures. The branch for each

gutter outlet is 4 inches, the submain 5 inches, another 5-inch submain receives a 4-inch branch from the water-closet and 3-inch branches from the floor cesspools, the urinal, and the waste outlet from the needle bath.

All outlets are safely trapped, and the traps provided with cleanouts. The drains are fully ventilated by means



of three 4-inch galvanized wrought-iron ventilating pipes carried to and above the roof; and located one at the water-closet, one at the urinal, and one in the outer vestibule and staircase. All cast-iron drain pipes are put together with tightly leaded and calked joints, and the whole drainage system was tested by filling the pipes with water.

There are in the bathroom 30 overhead douches and nine hand sprays. These latter were all placed on the same wall where the needle bath stands.

The douches were made as shown by Fig. 9, and were designed to run $7\frac{1}{2}$ gallons per minute under 25 pounds pressure. When the warm-water apparatus ordered from Germany arrived, it was found that douches of pattern as per Fig. 10 were supplied with the apparatus. These douches have much finer holes, give a very effective spray, and use only about $2\frac{1}{2}$ gallons of water per minute. The German warm-water apparatus having been designed for

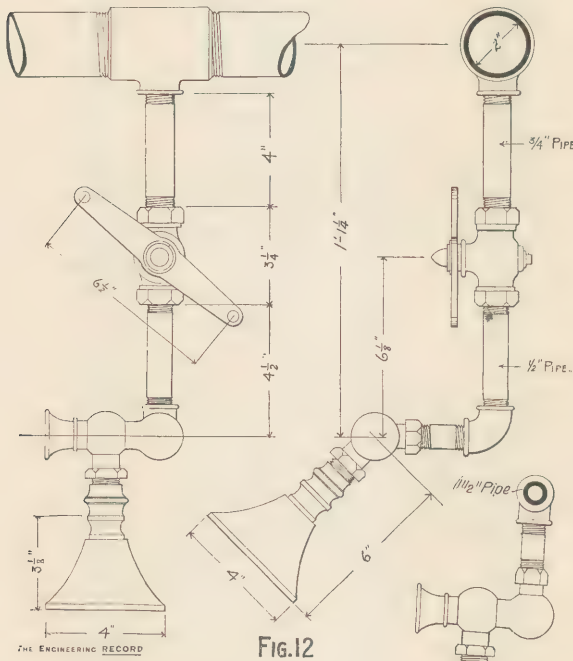


FIG. 11.

exactly this consumption at the douche, it was concluded to use the German form of douche, as being less wasteful of water.

The swivel joint, by which it is possible to set the overhead douche at any desired angle, was made to order and is shown in Fig. 11. The combination of douche, swivel joint, shut-off, and warm-water supply, is clearly shown in Fig. 12. The lever shut-off shown is, as a rule, kept quite open, except when a smaller number of patients is bathed. The douche stands inclined at such an angle that it will strike the bather from the neck downwards.

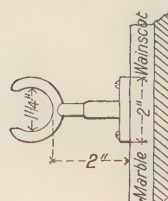
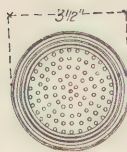
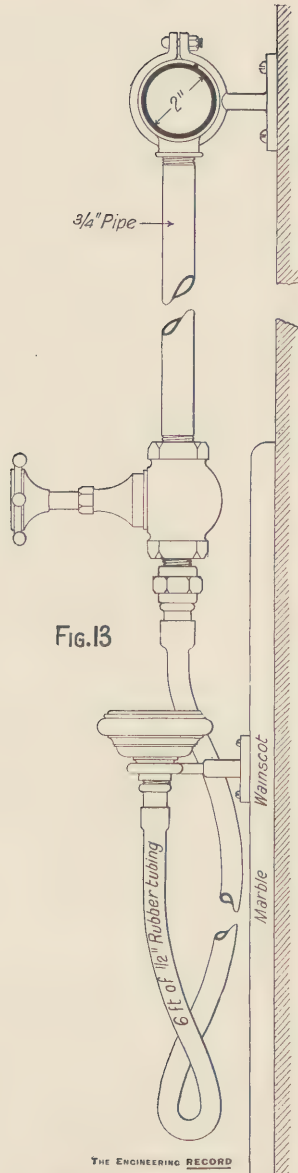


Figure 13 shows in detail the construction of the hand spray and the fork in which the spray is supported on the wall. Figure 14 shows the pattern of soap cup used, of which 12 were distributed along, and screwed to, the marble walls, at such a height above the floor that patients would not be so liable to come in contact with them.

The needle bath is a combination needle, shower, liver, spray, and bidet jet bath, and is intended for special use. It has a large open nickel-plated floor strainer and waste, two marble partitions, 6 feet high, and in front a white rubber curtain hung on a nickel-plated brass pole. It is supplied with warm water of about 100° Fahr. from the nearest hot-water apparatus, but it also has combination valves, with thermometer, enabling the bather to turn on either warm water only, or to temper the same further by the opening of the cold-water valve. Four separate labeled valves control the overhead shower, the side needle sprays, the liver sprays, and the ascending bidet jet, at the pleasure of the bather.

The water-closet is a porcelain flushing-rim long hopper, with open oak seat. The hopper is trapped by an iron enameled trap of special design. It is flushed automatically by seat action from a closed galvanized-iron flushing tank, in which the air is compressed by the pressure of the water supplying the tank. Upon releasing the seat the supply is cut off, and the connection between the flush pipe and closet flushing-rim is opened, permitting the water to rush into the rim of the bowl and effectually flushing the hopper. This type of automatic closet does not unnecessarily waste water, and has been found especially adapted to the needs of hospitals for the insane. The water-closet is set entirely free on a marble countersunk platform, and the sides of the closet are also of marble, 7½ feet high. Latticed flap doors of ash, with double-action spring hinges, are fastened to the marble stiles.

The entire urinal stall is of marble, and has a countersunk marble floor slab, without outlet. The urinal is a porcelain bowl, with large outlet, unobstructed by a strainer. It has a 2-inch lead waste pipe trapped by a 2-inch lead trap, set behind the marble, but made accessible by means of a nickel-plated brass cleaning trap screw, coming out in front of the marble. The urinal is flushed automatically from a "Yeteve" copper-lined flush tank, operating somewhat on the principle of the Rogers Field annular syphon. The intervals between flushes can be regulated as desired, and the capacity of the flush tank is five gallons.

In the dressing-room two ¾-inch nickel-plated sill cocks are provided near the warm-water apparatus. They are intended for hose connection, to enable the attendants

to wash the tiled floor of the dressing-room, the waste water passing away rapidly through the special brass floor cesspools provided. The cover of these floor cesspools is ordinarily kept closed.

Two 3-inch galvanized-iron fire stand-pipes are provided as shown on plans, with outlets for fire valves on the second floor, in the staircase, and in the clothes-assorting room adjoining the laundry.

The fire valves are $2\frac{1}{2}$ -inch, each of these having 50 feet of best unlined linen fire hose attached, supported on swinging hose racks.

The dumb waiter in the dressing-room is intended for sending up to the assorting-room the soiled underclothing of the patients when these are undressed. The 42 lockers in same room are intended to hold the patients' clothing while they are being bathed. They are called lockers, although doors with locks were purposely omitted.

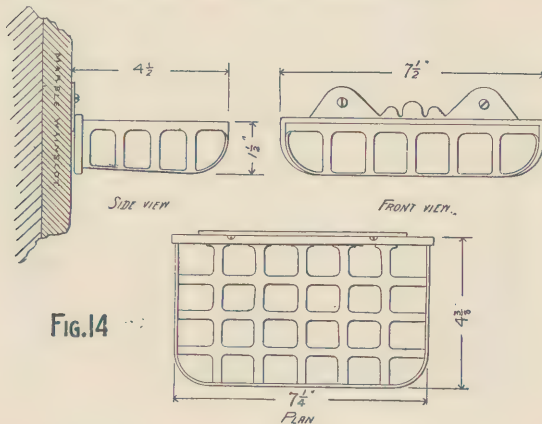


FIG. 14

The dressing-room is provided with sufficient benches, made of ash, to accommodate 40 patients. Some benches are made stationary and are carried along the free walls as shown in plan. There are also one long single and one short double portable benches placed in the center of the dressing-room. Cork mats will probably be laid on the floor of the dressing-room to keep the floor dry and the feet of the bathers warm. Similar benches are being used experimentally in the bathroom proper to enable the bathers to sit down while washing their feet.

The apparatus for warming water for bathing purposes is shown in Fig. 15 in front and side elevation. It is manufactured by H. Schaffstaedt, of Giessen, Germany, and is called a "Gegenstrom" (counterstream) apparatus. Each apparatus is designed and calculated to supply 10 douches, running at the rate of $2\frac{1}{2}$ gallons per minute under 25 pounds water pressure, with warm water

of a temperature not exceeding 110° Fahr. (with all 10 douches running simultaneously). These are the first apparatus of this kind ever used in this country. Referring to the letters in this figure, the various parts of the apparatus are as follows: A is the inlet for cold water,

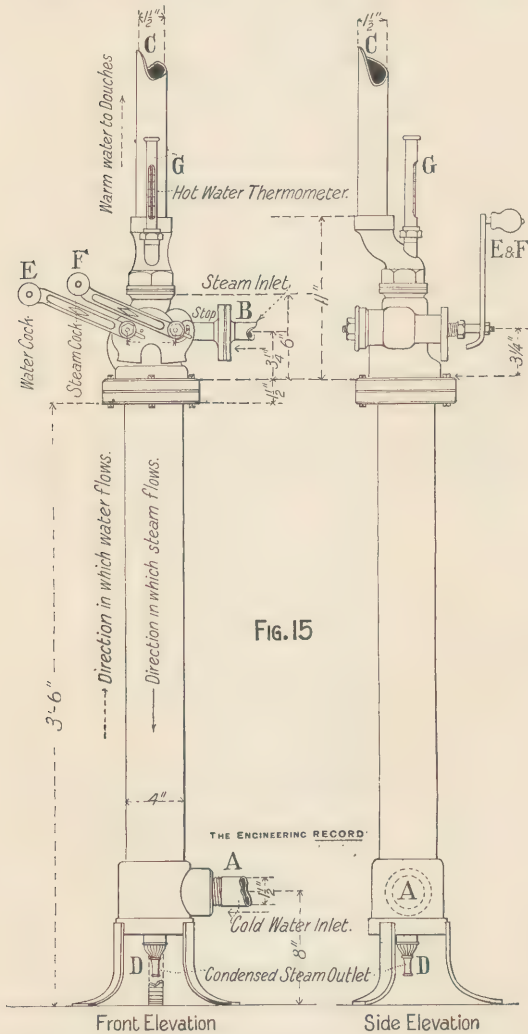


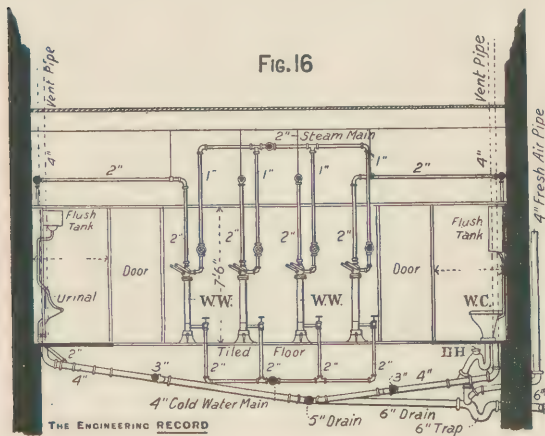
FIG. 15

and B is the inlet for steam. C is the warm-water outlet pipe leading to the douches, and D is the outlet pipe or return pipe for condensed steam. E is the cold-water cock, and F the steam cock. G is a hot-water thermometer, graded to indicate up to 220° Fahr. The principal dimensions of the apparatus are figured in the drawings,

and a cross-section through the dressing-room showing the apparatus in place is shown in Fig. 16.

A complete description of this apparatus, setting forth its chief advantages, was published by the writer in the *American Architect* of June 2, 1894. The writer is able to state that the apparatus put up at the Utica State Hospital works just as anticipated, and so far as known to him has proved in actual use in every way satisfactory.

All the piping in the bathroom and at the warm-water apparatus is tinned and annealed brass pipe, nickel-plated at the fixtures. The sizes of pipes are as follows: The water main to bathhouse is 4 inches, of galvanized wrought iron, with 3-inch branches to each fire stand-pipe, the cold-supply branch to each of the four warm-water apparatus is a 2-inch galvanized wrought-iron pipe, controlled at the apparatus by an angle valve. The warm-



water main from each apparatus is 2 inches, with $\frac{3}{4}$ -inch T branches reduced further to $\frac{1}{2}$ -inch to each douche or spray. The warm-water supply to the needle bath is a 1-inch pipe. The sill cocks are supplied by $\frac{3}{4}$ -inch pipe, the flushing tanks of water-closet and urinal each by a $\frac{1}{2}$ -inch pipe.

The steam supply to the warm-water apparatus is a 2-inch high-pressure main (60 pounds pressure), with 1-inch branches to each apparatus, controlled by a globe valve. The return pipe for condensed steam from each apparatus is one-half inch in diameter.

The bath and dressing rooms are heated from overhead steam pipes, to avoid the placing of radiators or pipe coils where patients would be in danger of scalding. Large steam pipes are passed through the pipe tunnel, which is in communication with the exca-

vated space under the bathhouse. The heat radiating from these pipes, and if necessary some additional steam pipes placed in this space, are intended to warm the tiled floor in the bath and dressing rooms so as to prevent the bathers' feet becoming chilled. The vestibule, stairway, and connecting corridors leading to the wards will also be heated so as to prevent patients from catching cold when returning to the wards after the bath.

Ventilation of the bathroom is accomplished by two large flues, having ventilating registers at the ceiling of the dressing-room and of the bathroom, which flues are extended through the second floor and above the roof of the bathhouse.

In daytime the bathhouse is amply lighted by 11 windows (eight in the bathroom and three in the dressing-room), with panes of glass rendered opaque to secure privacy. The bathhouse is also to be wired for incandescent electric lamps suspended from the ceiling.

All requirements of sanitation have been strictly observed in the arrangement and construction of the bathhouse. The drainage is arranged with particular care. All outlets into the sewer system have been safely trapped, the drains are amply ventilated, the water-closet and urinal are of the best available type for hospital use, and the whole plumbing system has been made tight and tested, and is safe against escape of sewer air.

Allowing five minutes for undressing, 15 minutes for bathing and drying, and 10 minutes for dressing, each bath would occupy 30 minutes; hence as there are 39 douches and sprays 78 patients can be bathed per hour, or in five hours per day 390, approximating 400 patients. The amount of water used for each bather would be in 10 minutes about 25 gallons, or $25 \times 78 = 1,950$ gallons per hour, or 9,750 gallons in five hours for bathing 390 patients.

The douches, swivel joints, hand sprays, and needle bath were made by the J. L. Mott Iron Works, New York City. Mr. John F. Hughes, builder, of Utica, N. Y., was the contractor for the floor construction, and the Stradling Plumbing and Heating Company, also of Utica, were the contractors for the plumbing-work and all marble-work. The Schaffstaedt warm-water apparatus was imported from Germany, through Messrs. Henry Huber & Co., New York City.

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